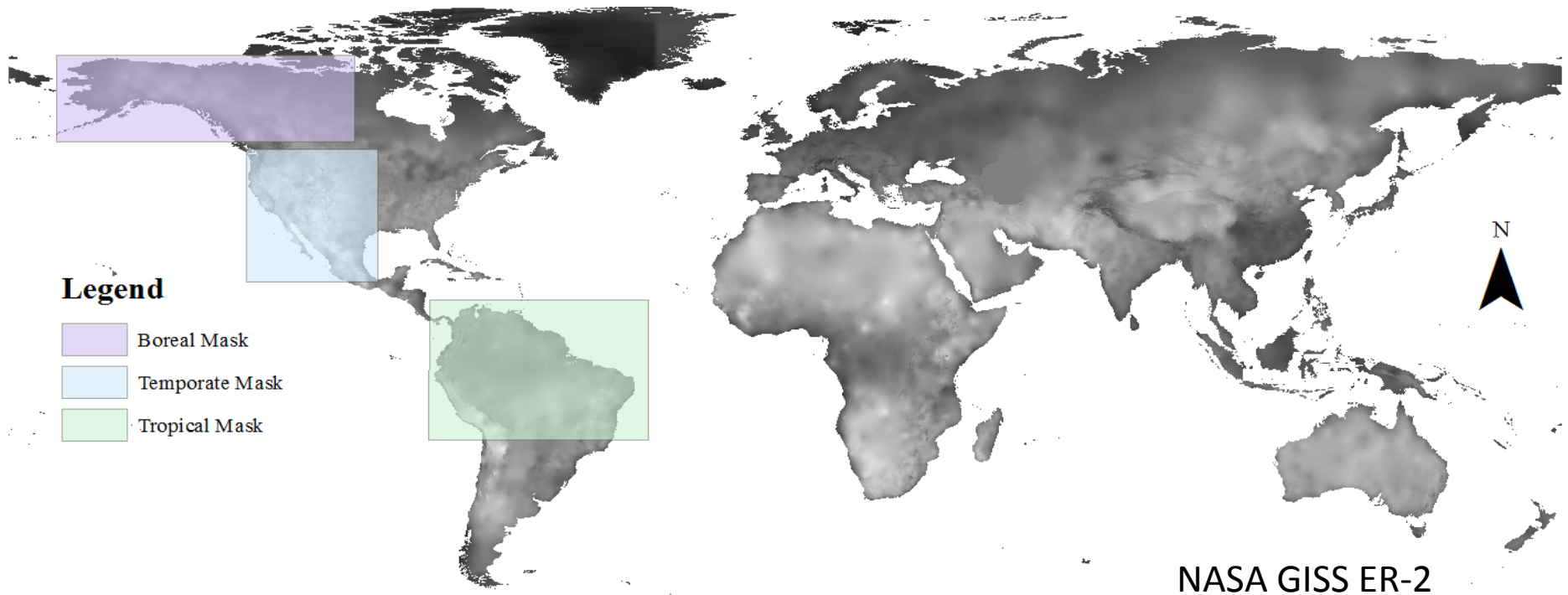


MaxEnt: Modeling Terrestrial Ecology Under Climate Change



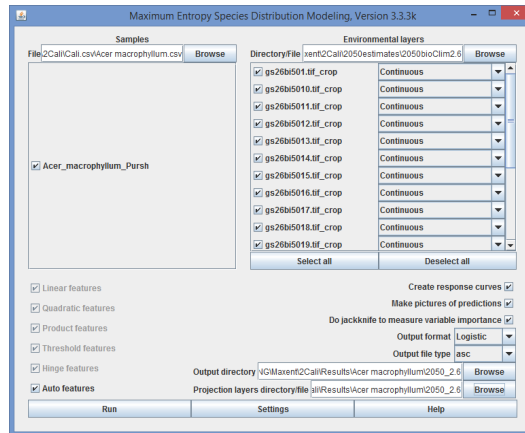
Earth Science & Data Science

SDM & GCM

Informatics & Analytics

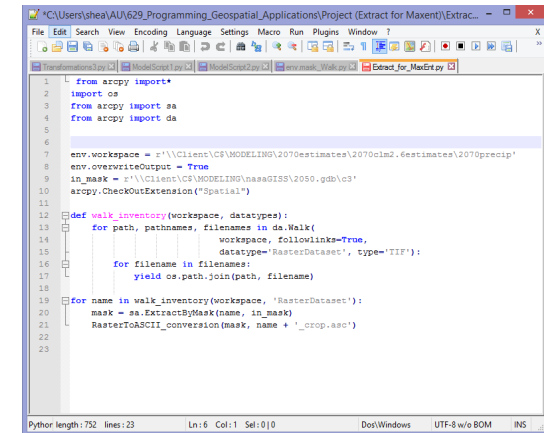
Model Inputs: Species & Climate Data

Statistical Model UI



BioClim Variables	Descriptions of Bioclimatic Variables
/*BIO1	Annual Mean Temperature
/*BIO2	Mean Diurnal Range (Mean of monthly *100)
/*BIO3	Isothermality (P2/P7) (* 100)
/*BIO4	Temperature Seasonality (standard deviation *100)
/*BIO5	Max Temperature of Warmest Month
/*BIO6	Min Temperature of Coldest Month
/*BIO7	Temperature Annual Range (P5-P6)
/*BIO8	Mean Temperature of Wettest Quarter
/*BIO9	Mean Temperature of Driest Quarter
/*BIO10	Mean Temperature of Warmest Quarter
/*BIO11	Mean Temperature of Coldest Quarter
/*BIO12	Annual Precipitation
/*BIO13	Precipitation of Wettest Month
/*BIO14	Precipitation of Driest Month
/*BIO15	Precipitation Seasonality (Coefficient of Variation)
/*BIO16	Precipitation of Wettest Quarter
/*BIO17	Precipitation of Driest Quarter
/*BIO18	Precipitation of Warmest Quarter
/*BIO19	Precipitation of Coldest Quarter

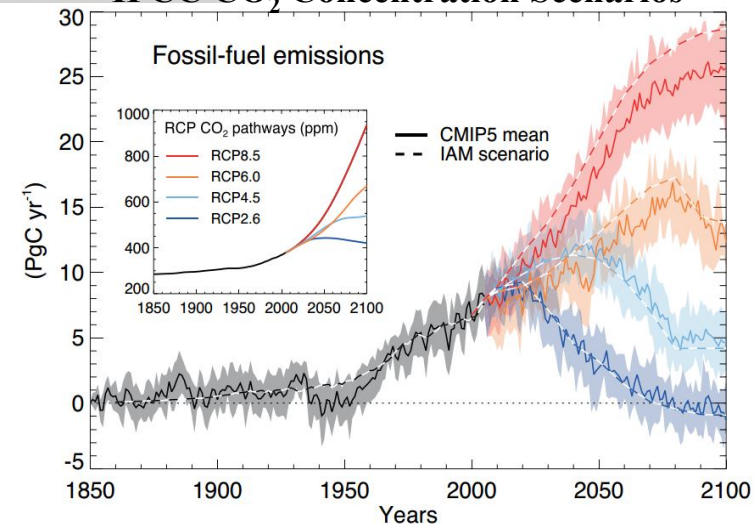
ArcPy Code



Geospatial Data Science Informatics:

Extraction- ArcGIS toolbox, Extract by Mask
Transformation –Independent Variables TIF to ASCII, Dependent Variables TXT to CSV
Loading: ASCII & CSV into MaxEnt interface

IPCC CO₂ Concentration Scenarios



Maximum Entropy Modeling

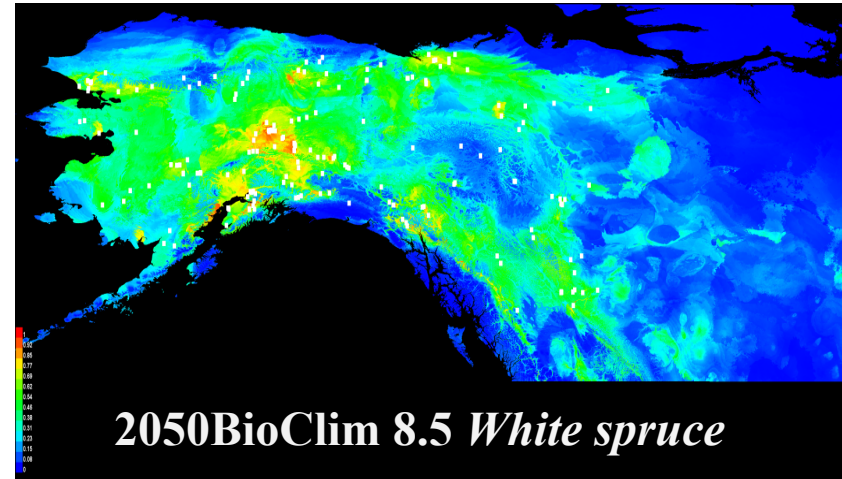
Geospatial Data Science Analytics:

Spatial Statistics

- Spatial Probability Density function
- maximizing the entropy (spread) of the SPDF

Machine Learning

- Supervised ML (training samples)
- Sequential update algorithm
- Features (transformation functions)
 - +Linear
 - +Polynomial
 - +Hinge
 - +Threshold



$$Pr(y = 1 \mid z) = f_1(z)Pr(y=1)/f(z)$$

